CHAPTER 15

Public Utilities

Introduction

The City of Lynchburg has made a large capital investment to create a safe and reliable water supply and a wastewater treatment system that is both cost-competitive and serves as an attraction to economic development. It also provides its citizens with quality solid waste management services through its Public Works Department. The City is working on developing and implementing a comprehensive stormwater management program.

While it appears that the City's systems are capable of handling current and projected water, sewer, and solid waste needs, the City must continue to maintain and upgrade its facilities. In addition, the City faces considerable challenges in eliminating the Combined Sewer Overflows (CSOs) under a mandate from the Environmental Protection Agency and the Virginia Department of Environmental Quality. The goals, objectives, and strategies of this element are intended to enhance the City's ability to provide its citizens with safe, reliable, and cost-effective public utilities.

Context & Recommendations

Water Treatment and Distribution

The City of Lynchburg has one of the oldest municipal water systems in the nation and the quality of its water has long been a source of community pride. With two sources of raw water and two water filtration plants, there is adequate supply and treatment capacity to serve the entire City. The primary raw water source for the City is the Pedlar Reservoir, with additional supplies coming from the James River during periods of greater demand. Possessing rights that can be traced back to colonial times, the City has rights to one-fifth of the flow from the James River at Lynchburg for current and future use. The City's new Water System Master Plan, scheduled to be completed in July 2002, will address the issue of the City supplying water to portions of the surrounding counties.

According to the Draft Water System Master Plan, dated May 2001, the City has a complex water distribution system, due to its hilly terrain. The water system includes seven primary pressure zones with several additional small zones, two water treatment plants, nine water storage tanks, and several pump stations. Water is

currently treated at the College Hill Water Treatment Plant (WTP), located in the City, and at the Abert WTP, located in Bedford County. The College Hill WTP was completed in 1958, upgraded to a high rate facility in the 1980s, and now has a rated capacity of 14 million gallons per day (mgd). The Abert WTP was constructed in 1974 and has a rated capacity of 12 mgd. The average amount of water produced is 11.5 mgd; under normal conditions approximately half the flow is treated at Abert and half at College Hill. Because of their ages, both plants need repairs and upgrades.

A main concern for the future of the water system is the condition of the existing treatment facilities and major transmission systems. According to the City's recently completed report, *Infrastructure: Value, Condition and Priority Needs, 2002-2003*, both water treatment plants, the Abert pump station, and the water transmission line from the Pedlar Reservoir to the Abert WTP are in "fair" condition and need upgrades. The raw water transmission line from the Pedlar Reservoir was installed in the mid 1930s and averages two to four breaks per year. Based on the infrastructure report and the *Water System Master Plan*, the City should also evaluate the long-term viability of the Pedlar Reservoir, as well as the impacts of increased use of James River water. During the planning process, several residents commented on their preference for Pedlar Reservoir water.

In addition to needed upgrades at several of the water system's major facilities, many of the smaller (12" and less) distribution lines and valves are the among the oldest in the system and are deteriorating. The problems are especially acute in the Downtown area, where replacement of lines is extremely costly and difficult. Some of the problems include frequent water line breaks and inoperable water valves. Inoperable water valves prevent control of the system in the event of a break, or when maintenance is needed, or as necessary to establish a directional water system flushing program. The *Water System Master Plan* includes a review of the entire water system and recommendations for improvements to solve such problems.

The availability and quality of City water is an economic development tool—a major benefit to attract new businesses and industries. Several industries have located in Lynchburg because of the water it offers. The City has expanded its water facilities to meet industry projected demands. However, in some cases, industry has not achieved its own projections, resulting in revenue shortfalls. The city should continue to exercise great care in offering infrastructure upgrades to attract new business and industry in order to avoid such shortfalls.

In addition to serving the City, the system can supply water to portions of Amherst, Bedford, and Campbell counties. Campbell County currently purchases very little water from the City. Recently, the City agreed to extend the waterline along US Route 460 to the Mt. Athos area of Campbell County. One of the major issues the City must address is the growing demand from surrounding counties, including service to Appomattox.

The provision of water and sewer service is made under existing contractual agreements, but the City needs to reevaluate whether the revenues received are enough to offset the possible consequences of providing service to areas outside the City. The provision of water and sewer service to outlying areas is among the prime determinants of the location and density of commercial and industrial development and could contribute to urban sprawl. The City should evaluate whether extending service will have an adverse impact on its chances of retaining existing or capturing new development inside the City limits. The City should develop a protocol for evaluating non-city water service applications that considers capacity and economic impacts.

Wastewater Collection and Treatment

Lynchburg constructed its wastewater treatment plant in 1955. The Lynchburg Regional Wastewater Treatment Plant (WWTP), located on the Concord Turnpike, provides secondary treatment, has a capacity of 22 million gallons per day (mgd), and treats an average of 13-13.5 mgd. The City has invested over $30 million in five separate upgrades to the WWTP, three of which have occurred during the last 10 years. According to the City's recent infrastructure report, the buildings, structures, and equipment of the WWTP are of various ages; it is estimated that 10 percent of the plant is in poor condition, 40 percent in fair condition, 45 percent in good condition, and 5 percent in excellent condition. Several components of the plant have been in service for over 25 years and will need to be replaced or rehabilitated in the near future. The City should explore the use of alternative disinfection systems because of the hazards associated with the use of chlorine gas as a disinfectant.

The collection system consists of approximately 460 miles of sewer lines ranging in size from 8 inches to 60 inches in diameter. Approximately 138 miles are combined sewers; they transport both sanitary and stormwater flows to the WWTP. An estimated 117 miles of sewer line are in poor condition, 191 miles are in fair condition, 75 miles are in good condition, and 77 miles are in excellent condition. Since two-thirds of these sewer lines are in less than good condition, the City should continue its program of rehabilitation and replacement.

The City provides wastewater service to portions of Amherst, Bedford, and Campbell counties. These counties collectively own a total of 4.5 million gallons per day (mgd) capacity in the WWTP, and costs for plant improvements are shared proportionally based on capacity ownership. Bedford and Campbell counties also pay for capacity in the sewer lines that connect them to the WWTP, while Amherst County pumps directly to the plant. Each county presently uses 10-20% of its available capacity. The City needs to evaluate whether it wishes to continue and/or expand wastewater service to these counties.

As with its water system, the City has used the availability of wastewater treatment as an economic development tool—a major benefit to attract new

businesses and industries. Several industries have located in Lynchburg because of the combination of available water and wastewater treatment. The wastewater treatment plant has been expanded to meet industry projected demands. However, industry has not always achieved its own projections resulting in revenue shortfalls. The City should continue to exercise great care in offering infrastructure upgrades to attract new business and industry in order to avoid such shortfalls.

Many residents have commented that certain areas within the City do not presently have access to sanitary sewer and are served by on-site septic systems. These areas were annexed in 1976 and include: Tyreeanna/Pleasant Valley, Candlers Mountain, the northwestern corner of the City (Boonsboro area), Richland Hills, and a few other small areas near the southern edge of the City. In these areas, aging and failing septic systems are causing problems for some of the homeowners and may result in neighborhood deterioration. An ordinance is in place that governs the extension of sewer service to such areas with cost sharing from residents or developers. Sewers are often extended in response to a petition from residents and may be completed incrementally on a property-by-property basis. The City should evaluate its current policy and develop a plan for extending sewer service to unserved areas. Issues to consider include: the cost effectiveness of incremental versus areawide extension, the level of resident/landowner support, the methods for determining support, mandatory versus voluntary connection, connection tied to property ownership transfer, and connection incentives. The City should also consider requiring that new residential subdivisions be connected to sanitary sewer.

The Combined Sewer Overflow (CSO) Project

For several years, capital spending related to wastewater has been focused on the City's federally mandated program to eliminate combined sewer overflows (CSOs). A CSO is a discharge point for a combination of untreated sanitary waste and stormwater flows into a waterway during a rainfall event. The City's original sewer system provided only one pipe to collect both flows. The single pipe, however, was not large enough to carry the combined flows to the treatment plant. CSO discharge points were installed at critical points in the system, so that during heavy rainfall the combined waste could bypass the system and discharge directly into the adjacent stream or creek. Many discharge points are located in congested urban neighborhoods and pose a possible health risk.

The elimination of CSOs is a high priority issue for the Environmental Protection Agency. Its program is administered through the Virginia Department of Environmental Quality. The City and the State of Virginia have agreed to a Special Consent Court Order, which provides guidance and implementation parameters for the City to follow to eliminate the CSOs. Lynchburg and the City of Richmond have been required to commit significant resources to the effort. The City's CSO program has three main components: a rainleader disconnect program, interceptor replacements, and the separation of stormwater collection structures from the

sanitary sewer system. All three programs are being implemented concurrently. With the lowest effective cost of the three, the rainleader disconnect program has been implemented successfully and has provided substantial reductions in stormwater volumes in the sanitary sewer system. The other two programs are ongoing.

At the beginning of the separation project, there were 174 miles of combined sewers and a total of 132 overflows. As of 2000, approximately one-fourth of the combined sewers have been separated and 72 CSOs have been permanently closed. Total costs for this program are estimated at $276 million and will take a minimum of 15 years. Funding is through a combination of federal, state, and local funds. In addition to the separation of the sewers and closure of the CSOs, the program includes provisions for curbs and gutters, where necessary to facilitate collection of street runoff, and replacement of older, undersized water lines.

The City's ability to complete the CSO elimination program in a timely manner is controlled by the generation of revenue from sewer rates and the debt service paid on previously borrowed capital funds. Part of the City's CSO agreement with the federal and state authorities caps the maximum sewer rate, based on median household income (MHI). Much of the cost of the CSO program thus far has been paid for by raising sewer rates over 160 percent in the last ten years. City sewer rates are among the highest in the Commonwealth. The City is also reaching the maximum capacity to issue further debt. Reaching that maximum combined with the already high sewer rates is a major concern affecting implementation of the remainder of the CSO program.

The City has also received federal and state grants that help to accelerate the implementation of CSO projects. Additionally, the City's consent order allows it to shift project priorities based upon the City's development needs. Expansion of the City's sewer system is allowed as long as it increases the sewer revenue base.

Daily flows to the WWTP are expected to be steady and possibly decline as the CSO elimination program proceeds. Other factors that have major impacts on the WWTP include:

- Fluctuations in quantity and quality from existing industries affect revenue and can hinder treatment processes.
- Potential new industries that decide to locate in Lynchburg will have their own requirements.
- The availability of other possible revenue sources.

Stormwater Management

Another key issue raised during Plan preparation is the need for a comprehensive approach to stormwater management. The City's existing Stormwater Management Ordinance should be reviewed for its effectiveness in managing problems such as erosion, sedimentation, and runoff associated with land development.

The ineffectiveness, poor aesthetics, and maintenance difficulties associated with smaller best management practices (BMPs) for treatment of stormwater in commercial and residential development areas have also been discussed during the planning process. The use of large neighborhood or regional BMPs in certain areas is under consideration and is being done as part of many CSO projects, especially at those locations receiving significant stormwater flows from outside the City.

The City should develop a stormwater master plan to provide guidance for assessing the implications of long-range development patterns and to offer a regional or watershed approach to stormwater management. The stormwater master plan would allow the City to address water quality issues and plan for compliance with the Clean Water Act's National Pollution Discharge Elimination System (NPDES) Phase II requirements. Financing of stormwater management is a difficult issue facing many communities. The Plan calls for an assessment of the feasibility of creating a stormwater utility to provide resources for stormwater management in the City.

Solid Waste

Solid waste management is another position of strength for the City. The City landfill offers competitive tipping fees and has sufficient capacity until 2014. There are opportunities for expansion of the existing facility beyond that time to meet long-term growth needs of the City and, possibly, the region. One possible source of revenue would be to market the landfill to surrounding localities for their disposal needs.

City of Lynchburg Landfill.

To serve its residents and to reduce the potential for "midnight dumping" of unwanted and possibly toxic items, the City has several programs for disposal of waste in addition to regular household waste. There is a collection program for brush and bulk items. By calling one number, residents can have their yard waste and bulk items scheduled for pickup. This program replaces one where residents had to put these items out at designated times. The City also allows each household one trip to the landfill each month for which there is no additional

charge. The City should consider disposal alternatives for these items, such as composting and recycling of leaves and yard waste, recycling of white goods (i.e., appliances), and possible programs for donation of items no longer desired by their owners, but possibly still useful to another household.

Four times per year, the City schedules household hazardous waste collection days, when residents can bring to the landfill those items that are too toxic to be poured down a drain or disposed of in the landfill. A few examples of these materials are oven cleaners, furniture strippers, pesticides, photo chemicals, and used motor oil.

At the present time, the City is landfilling sludge from the wastewater treatment plant. The odors resulting from this practice have been the subject of many complaints from neighbors. Finding an alternative to landfilling the sludge would both eliminate the source of the odor and extend the life of the landfill.

The City should monitor its solid waste capacity needs, as well as the capacity needs of surrounding counties. The City should actively participate in any long-term regional solid waste management planning efforts, which could be handled through the Region 2000 Regional Commission.

The City currently provides recycling services for a number of items, including newspapers, food and beverage cans, plastic containers, and mixed paper. Residents are required to separate these items and take them to one of nine sites where the items are sorted into large containers. Curbside collection is not available for recyclables.

Goals, Objectives & Strategies

Goal 1. Provide the citizens of Lynchburg with dependable, modern, high quality water and sanitary sewer service with sufficient system capacity to meet the City's long-term requirements.

Objective 1.A. **Maintenance & Replacement.** Continue the Public Works Department's focus on maintenance of the existing water system and replacement of old mains.

1) Focus on the maintenance of existing capacity and the replacement of older mains.

2) Continue the replacement of small diameter residential mains coordinated with Combined Sewer Overflow projects, while addressing new development needs and resident complaints.

Objective 1.B. **Drinking Water.** Protect the Pedlar Reservoir as the primary source of drinking water for the citizens of Lynchburg.

Objective 1.C. **Water Rates.** Continue to market the City's competitive water rates to industry and other development.

1) Structure water rates to provide incentives for development within the City as compared to counties, especially for large industrial users.

Objective 1.D. **City Benefits.** Maximize City benefits related to the sale of water and sewer service and capacity to the surrounding region.

1) Develop a protocol for evaluating applications for additional water and sewer service outside the City that considers the overall economic and system capacity impacts of providing the service.

2) Prior to entering into additional agreements for service outside the City, assess the impact such provision will have on the long-term water supply and the capacity of water and sewer systems.

3) In no case should the City allocate water or sewer system capacity to users outside of the City if such allocation would exceed the City's projected need.

4) Evaluate existing agreements for the sale of water and sewer service to Amherst, Bedford, and Campbell counties and update or renegotiate the agreements as they expire.

5) Review water and sewer rates to counties annually to confirm that City costs related to the provision of service, including related infrastructure construction, do not exceed funds collected.

6) Recoup costs completely when the provision of water or sewer service to the surrounding counties necessitates the construction of infrastructure or treatment plant upgrades.

7) Do not allow the extension of City water and sewer service into surrounding counties to promote sprawl or weaken the commercial, industrial, and business base of the City.

Objective 1.E. **Water System Master Plan.** Update the Water System Master Plan with a focus on the City's long-term capacity and supply needs.

1) Maintain sufficient treatment capacity to sustain City growth, while meeting regulatory water quality requirements.

2) Assess the long-term viability of the Pedlar Reservoir as a primary water supply source and the James River as a secondary source.

3) Assess the condition of the raw water transmission line from Pedlar Reservoir and make appropriate recommendations for its ultimate replacement. The line could last for another 25 years, but it is essential to start planning now because the line will likely be replaced in sections and will be very expensive.

4) Implement, to the maximum extent feasible, the Water System Master Plan update recommendations for the long-term maintenance of water supply and transmission capacity.

5) Analyze the impacts of using James River water on both water quality and treatment cost prior to making any commitments for water service extensions to the surrounding counties that would require supplementing the City's primary raw water source with James River water.

Objective 1.F. **Sewer Service Extension.** Evaluate the City's program to provide sanitary sewer service to unsewered areas within the City limits.

1) Develop a plan for needed extensions of sanitary sewer to unsewered areas within the City.

2) Determine a minimum length of sewer line extension that permits economies of scale (i.e., number of houses, length of pipe in feet), rather than extending sewer lines in small increments.

3) Determine the support of residents in unsewered areas for sewer extension and connection.

4) Develop policies for sewer extension when septic system failures are threatening the public health and/or water quality.

5) Determine the conditions under which existing residences and new residential construction should be required to connect to sanitary sewer.

6) In situations where connection is not required, create incentives for connection.

Goal 2. Maintain the priority of and commitment to execution of the City's Combined Sewer Overflow elimination program with a goal of program completion by 2020.

Objective 2.A. **Commitment.** Maximize the level of effort and commitment devoted to the completion of the Combined Sewer Overflow elimination program.

1) Continue pursuit of federal and state grant funding related to implementation of the program.

2) Maximize the utilization of sewer funds for execution of the CSO program.

3) Actively seek alternative sources of grant funding for specific CSO projects.

4) For all new easements that may be required in conjunction with CSO projects, include the option of using the easement for recreational purposes.

Goal 3. Maintain a comprehensive approach to stormwater management with a focus on addressing regional stormwater issues.

Objective 3.A. **Effectiveness.** Monitor the effectiveness and applicability of the existing stormwater management ordinance and identify recommendations for improving its effectiveness.

1) Bi-annually review the existing ordinance for effectiveness in managing the control of erosion and sediment releases related to land development in the City.

2) Continue to enforce compliance with the Virginia Erosion and Sediment Control Handbook and the City Erosion and Sediment Control Ordinance.

Objective 3.B. **NPDES Requirements and Stormwater Management Planning.** Develop a plan for compliance with the Environmental Protection Agency's (EPA) Phase II stormwater regulations including National Pollution Discharge Elimination System (NPDES) permit requirements.

1) Actively participate in a regional initiative to develop a program that complies with the EPA Phase II requirements.

2) Incorporate the applicable components of the existing CSO elimination program to aid in program development, including public education and outreach, illicit discharge elimination, and public participation.

3) Develop a stormwater master plan to assess the long-term impacts on City watersheds that may result from development, based upon the Future Land Use Map and related chapters of the Comprehensive Plan.

4) Continue to support development of a regional stormwater management plan, as proposed between the City and Bedford County, to address impacts on the City from development in the urbanized areas of the adjacent counties.

5) Actively pursue long-term cost-sharing for the management of stormwater runoff from the adjacent counties.

6) Evaluate the value and practicality of the creation of a stormwater utility to address regional stormwater needs.

Goal 4. Maintain the focus on the City's long-term solid waste management needs, including the regionalization of solid waste management services.

Objective 4.A. **Surplus Capacity.** Maintain surplus landfill capacity to accommodate long-term growth of the City and region.

1) Actively monitor the need for solid waste facility expansion and proceed with design and implementation at the appropriate time.

Objective 4.B. **Regionalization.** Evaluate opportunities related to the regionalization of solid waste management operations.

1) Monitor the needs of the adjacent counties related to solid waste issues.

2) Participate in the development of a long-term regional solid waste management plan.

Objective 4.C. **Recycling.** Actively evaluate and, if feasible, pursue opportunities to expand citywide recycling.

1) Evaluate curbside recycling service and implement such service, if appropriate.

2) Actively encourage residential, commercial, and industrial participation in recycling programs.

Objective 4.D. **Landfilling Sludge and Vegetative Waste.** Continue to evaluate alternatives to the landfilling of sludge and vegetative waste.